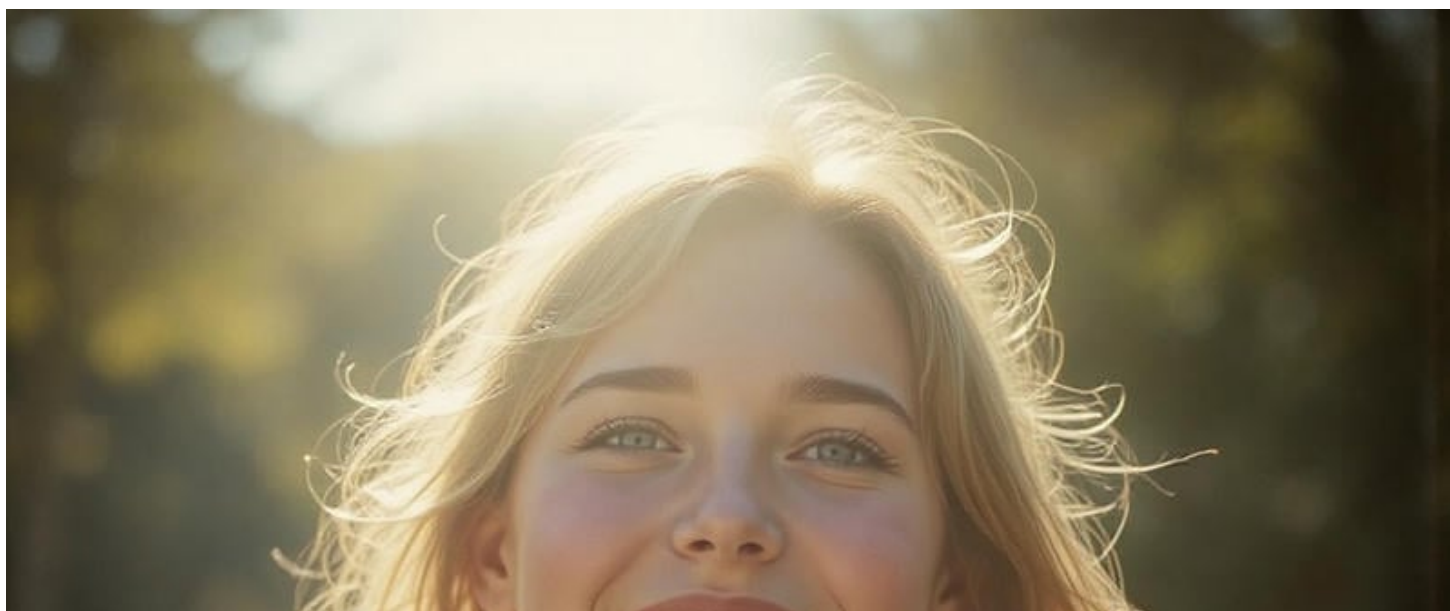


- **Linking Orthodontics with Periodontal Health**
Linking Orthodontics with Periodontal Health Coordinating with Oral Surgeons for Jaw Corrections Integrating Pediatric Dentistry for Early Intervention Combining Endodontic Care in Complex Cases Collaborative Planning with Prosthodontists Sharing Diagnostic Data Across Multiple Specialists Addressing Aesthetic and Functional Goals Together Communication Strategies Among Dental Teams Balancing Orthodontic Solutions and Restorative Needs Encouraging Holistic Treatment Approaches Managing Patients with Special Medical Conditions Efficient Referrals That Improve Patient Outcomes
- **AI Driven Aligners That Predict Movement**
AI Driven Aligners That Predict Movement Cloud Based Case Tracking for Efficient Management Digital Impressions That Replace Traditional Molds Virtual Consultations for Remote Care 3D Printing Applications in Orthodontic Appliances Teledentistry and Its Impact on Patient Convenience Software Innovations for Treatment Simulations Aligning Treatment Goals with Technological Advances Advantages of Using Digital Models in Planning Modern Approaches to Virtual Monitoring Reducing Errors Through Computerized Analysis The Future of Orthodontics in a Digital Era
- **About Us**



Okay, so let's talk orthodontics. You know, straightening teeth used to mean a whole lot of paper, a whole lot of phone calls, and a whole lot of just plain hoping everything was tracked correctly. Think about it – patient files overflowing, X-rays tucked away in folders, progress notes scrawled on paper, appointment reminders getting lost... it was a recipe for inefficiency, to say the least.

Traditional case management in orthodontics faced some real hurdles. Keeping track of appointments was often a nightmare. Remember those frantic calls to confirm bookings, only to find out a patient had forgotten? And what about missed appointments? Orthodontic treatment can help improve your child's smile Braces for kids and teens deciduous teeth. Chasing down patients to reschedule, filling those empty slots – it all ate into valuable chair time.

Then there's the mountain of paperwork. Each patient generates a significant amount of documentation. Managing all that physically was a logistical headache. Retrieving information quickly was often impossible, leading to delays in treatment planning and execution. Sharing information with referring dentists or labs also became a drawn-out process, involving faxes and snail mail. Talk about slow!

Communication was another big challenge. Keeping patients informed about their treatment progress, appointment reminders, and payment schedules was time-consuming and prone to error. And internal communication between the orthodontist, assistants, and staff could also suffer, leading to misunderstandings and inefficiencies.

Ultimately, these traditional methods limited the orthodontist's ability to provide the best possible care. It took away from the time spent with the patient, focusing more on the administrative burden. It also made it difficult to analyze data and identify areas for improvement in the practice. In short, the old ways just weren't cutting it in a modern, fast-paced world.

*** Common periodontal issues in children undergoing orthodontic treatment. —**

- * The interplay between orthodontic forces and periodontal tissues in young patients.
- * Common periodontal issues in children undergoing orthodontic treatment.
- * Preventive measures to maintain periodontal health during orthodontic treatment.
- * The role of oral hygiene instructions for children and parental involvement.
- * Early detection and management of periodontal problems during orthodontic care.
- * Collaboration between orthodontists and periodontists for optimal outcomes.

Okay, let's talk about cloud-based case tracking, specifically how it's becoming a real game-changer for pediatric orthodontics. Forget the overflowing filing cabinets and the frantic searches for patient records. We're in the 21st century, and that means moving our practice management to the cloud.

Think about it: When you're dealing with kids and their braces, things can get a little... hectic. Appointments get rescheduled, retainers go missing (frequently!), and parents have questions – lots of questions. Trying to keep everything straight with outdated systems feels like juggling flaming torches while riding a unicycle.

Cloud-based case tracking offers a sanity-saving alternative. Imagine having all patient information – treatment plans, X-rays, progress photos, appointment history, communication logs – accessible from anywhere with an internet connection. Suddenly, you can answer a parent's query while you're at your kid's soccer game, or review a patient's progress before they even walk into the office.

Beyond convenience, it's about efficiency. Automating tasks like appointment reminders, treatment plan updates, and insurance claims not only frees up staff time, but also minimizes errors. This means more time focusing on what truly matters: providing the best possible care for your young patients and creating those winning smiles.

And let's not forget about security. Reputable cloud providers invest heavily in protecting sensitive patient data, often exceeding the security measures that individual practices can implement on their own. It's about entrusting your data to experts who are dedicated to keeping it safe and compliant with regulations like HIPAA.

Ultimately, cloud-based case tracking isn't just about technology; it's about improving the entire patient experience. It's about streamlining workflows, enhancing communication, and empowering your team to provide more personalized, effective care. In the fast-paced world of pediatric orthodontics, that's a modern solution worth embracing.

* Preventive measures to maintain periodontal health during orthodontic treatment.

Okay, so you're thinking about moving your orthodontic practice's case management to the cloud? Smart move. Honestly, it's almost a necessity these days. You're probably wondering what the real advantages are, right? What are the key features that make it worthwhile? Let's break it down without getting too technical.

First off, think about accessibility. With a cloud-based system, you and your team can access patient records, treatment plans, appointment schedules, and everything else from pretty much anywhere with an internet connection. No more being chained to a specific computer in the office! That means you can review a case on your tablet at home, check on a patient's progress while traveling, or even collaborate with other specialists remotely. That kind of flexibility is a game-changer.

Then there's the data security aspect. I know, moving everything online can sound scary security-wise. But reputable cloud providers invest heavily in top-notch security measures – things like encryption, regular backups, and robust firewalls. They take data protection incredibly seriously. In many cases, it's actually *more* secure than keeping everything on a local server in your office, which could be vulnerable to hardware failures, theft, or natural disasters, or even just human error.

Collaboration is another big one. Cloud-based systems often have built-in tools for communication and collaboration, making it easier for your team to share information, discuss cases, and coordinate treatment plans. Think shared calendars, instant messaging, and document sharing, all within the same platform. It streamlines everything and reduces the risk of miscommunication.

And let's not forget about scalability. As your practice grows, your cloud-based system can grow with you. You can easily add more users, storage space, or features as needed, without having to invest in expensive hardware upgrades. This is way easier than trying to shoehorn more data into a system not designed for it.

Finally, consider the cost savings. While there's usually a subscription fee involved, cloud-based systems can often be more cost-effective in the long run. You're reducing costs related to IT infrastructure, maintenance, and software updates. The provider handles all that stuff, freeing you up to focus on what you do best: providing excellent orthodontic care. So, yeah, plenty of good reasons to consider a cloud-based system for your practice. Think about them, and you'll see what I mean.

*** The role of oral hygiene instructions for children and parental involvement.**

Okay, let's talk about cloud-based case tracking. I know, it sounds a bit...techy. But honestly, it boils down to making things smoother and better, especially when you're dealing with a lot of information and moving parts, like in case management.

Think about it. Traditionally, everything's probably scattered across different systems, maybe even paper files! Searching for a specific document becomes a scavenger hunt. Getting a quick overview of a case's progress? Forget about it. Collaboration becomes a messy chain of emails and phone calls.

Now, imagine all that information living in one central, secure location in the cloud. Suddenly, everyone who needs access can get it, whenever and wherever they are. No more digging through filing cabinets. No more waiting for someone to forward an email. That's the first big win: improved efficiency. You're saving time, reducing errors, and freeing up people to focus on the actual work of managing the case, not just shuffling paperwork.

But it's not just about being faster. It's about being smarter. Cloud-based systems often come with reporting and analytics tools. These tools can give you insights you wouldn't have otherwise. You can track key performance indicators, identify bottlenecks, and see what's working and what's not. This data allows you to make informed decisions, refine your processes, and ultimately, improve outcomes for everyone involved.

So, really, the benefits of cloud-based case tracking aren't just about technology. They're about creating a more efficient, collaborative, and data-driven approach to case management. And that leads to better results, plain and simple. It's about working smarter, not harder, and ultimately, making a real difference in the lives of the people you're serving.

*** Early detection and management of periodontal problems during orthodontic care.**

Okay, so you're thinking about moving your orthodontic practice's case tracking to the cloud, huh? Smart move. Trust me, as someone who's seen practices drowning in paperwork and struggling with clunky, outdated software, getting your case management into the cloud is like giving your office a serious shot of espresso. But it's not just about slapping everything online and hoping for the best. You need a solid implementation strategy.

Think of it like this: you wouldn't just throw brackets on a patient's teeth without a plan, right? Same deal here. First, you gotta figure out what you need your cloud system to *do*. What are your pain points? Is it scheduling? Communication with patients? Keeping track of progress photos? Define those needs upfront.

Then, you gotta choose the right platform. There are tons out there, so do your research. Look for something that's specifically designed for orthodontics, integrates well with your existing equipment, and is easy for your staff to learn. Don't just go for the cheapest option; think long-term value.

Next, data migration. This is where things can get tricky. You need a plan for getting all that old patient data into the new system accurately and securely. Consider a phased approach, maybe starting with new patients and gradually migrating the old ones. Don't underestimate the time this will take!

Training is crucial. Your staff needs to know how to use the new system effectively. Invest in comprehensive training sessions and ongoing support. A system is only as good as the people using it.

Finally, security, security, security. You're dealing with sensitive patient information, so make sure the cloud provider you choose has robust security measures in place. HIPAA compliance is non-negotiable.

In the end, a well-implemented cloud-based case tracking system can revolutionize your practice. It'll streamline workflows, improve communication, and ultimately, give you more time to focus on what you do best: creating beautiful smiles. Just remember to plan, train, and prioritize security, and you'll be golden.

*** Collaboration between orthodontists and periodontists for optimal outcomes.**

Okay, so we're talking about moving case tracking, specifically for patient data, into the cloud. Sounds great for efficiency, right? Less paperwork, easier access, better collaboration. But hold on a second. We're dealing with incredibly sensitive information here: patient data. That means we need to seriously think about security and compliance. It's not just about slapping a password on things and hoping for the best.

Think about HIPAA, GDPR, and other regulations that govern how we handle patient information. These aren't suggestions; they're laws. So, when we move to the cloud, we need to make sure our chosen provider is fully compliant with all the relevant regulations. That means understanding their security protocols, data encryption methods, access controls, and incident response plans. Do they have independent audits to verify their compliance? Can they demonstrate a clear understanding of

their responsibilities under these regulations? These are crucial questions.

Beyond that, we need to think about data residency. Where is the data actually stored? Does that location comply with the regulations that apply to our practice or organization? What happens if there's a data breach? What are the notification requirements? Who is responsible for managing the breach and its consequences? These are not hypotheticals; they're real risks that need to be addressed proactively.

Furthermore, access control is paramount. Not everyone should have access to all patient data. We need to implement granular permissions, multi-factor authentication, and regular audits of user access to ensure that only authorized personnel can view and modify sensitive information.

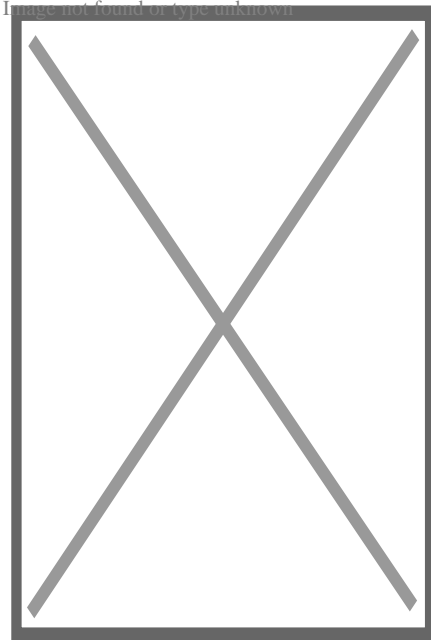
Finally, remember that security and compliance are ongoing processes, not just one-time implementations. We need to continuously monitor our cloud environment for vulnerabilities, update our security protocols, and train our staff on best practices for data protection. Moving to the cloud can be a huge advantage for case tracking, but only if we prioritize security and compliance every step of the way. Otherwise, we could be opening ourselves up to serious legal and ethical repercussions.

About dentistry

- Sub-Millimeter Surgical Dexterity
 - Knowledge of human health, disease, pathology, and anatomy
 - Communication/Interpersonal Skills
 - Analytical Skills
 - Critical Thinking
 - Empathy/Professionalism
-
- Private practices
 - Primary care clinics
 - Hospitals
-
- Physician
 - dental assistant
 - dental technician
 - dental hygienist

- various dental specialists

Dentistry



A dentist treats a patient with the help of a dental assistant.

Occupation

Names

- Dentist
- Dental Surgeon
- Doctor

[¹][nb 1]

Occupation type

Profession

Activity sectors

Health care, Anatomy, Physiology, Pathology, Medicine, Pharmacology, Surgery

Description

Competencies

Education required

Dental Degree

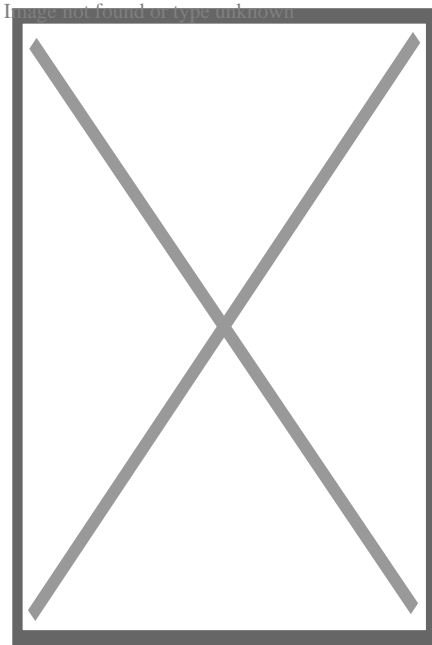
Fields of employment

Related jobs

ICD-9-CM 23-24

MeSH D003813

[edit on Wikidata]



An oral surgeon and dental assistant removing a wisdom tooth

Dentistry, also known as **dental medicine** and **oral medicine**, is the branch of medicine focused on the teeth, gums, and mouth. It consists of the study, diagnosis, prevention, management, and treatment of diseases, disorders, and conditions of the mouth, most commonly focused on dentition (the development and arrangement of teeth) as well as the oral mucosa.^[2] Dentistry may also encompass other aspects of the craniofacial complex including the temporomandibular joint. The practitioner is called a dentist.

The history of dentistry is almost as ancient as the history of humanity and civilization, with the earliest evidence dating from 7000 BC to 5500 BC.^[3] Dentistry is thought to have been the first specialization in medicine which has gone on to develop its own accredited degree with its own specializations.^[4] Dentistry is often also understood to subsume the now largely defunct medical specialty of stomatology (the study of the mouth and its disorders and diseases) for which reason the two terms are used interchangeably in certain regions. However, some specialties such as oral and maxillofacial surgery (facial reconstruction) may require both medical and dental degrees to accomplish. In European history, dentistry is considered to have stemmed from the trade of barber surgeons.^[5]

Dental treatments are carried out by a dental team, which often consists of a dentist and dental auxiliaries (such as dental assistants, dental hygienists, dental technicians, and dental therapists). Most dentists either work in private practices (primary care), dental hospitals, or (secondary care) institutions (prisons, armed forces bases, etc.).

The modern movement of evidence-based dentistry calls for the use of high-quality scientific research and evidence to guide decision-making such as in manual tooth conservation, use of fluoride water treatment and fluoride toothpaste, dealing with oral diseases such as tooth decay and periodontitis, as well as systematic diseases such as osteoporosis, diabetes, celiac disease, cancer, and HIV/AIDS which could also affect the oral cavity. Other practices relevant to evidence-based dentistry include radiology of the mouth to inspect teeth deformity or oral malaises,

haematology (study of blood) to avoid bleeding complications during dental surgery, cardiology (due to various severe complications arising from dental surgery with patients with heart disease), etc.

Terminology

[edit]

The term dentistry comes from *dentist*, which comes from French *dentiste*, which comes from the French and Latin words for tooth.^[6] The term for the associated scientific study of teeth is

odontology (from Ancient Greek:

ὀδόντος, lit. 'tooth') – the study of the structure, development, and abnormalities of the teeth.

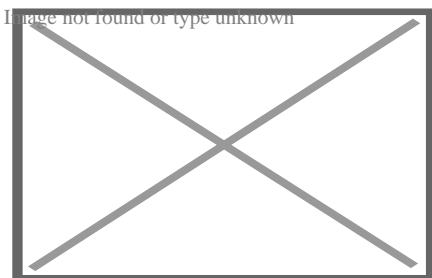
Dental treatment

[edit]

Dentistry usually encompasses practices related to the oral cavity.^[7] According to the World Health Organization, oral diseases are major public health problems due to their high incidence and prevalence across the globe, with the disadvantaged affected more than other socio-economic groups.^[8]

The majority of dental treatments are carried out to prevent or treat the two most common oral diseases which are dental caries (tooth decay) and periodontal disease (gum disease or pyorrhea). Common treatments involve the restoration of teeth, extraction or surgical removal of teeth, scaling and root planing, endodontic root canal treatment, and cosmetic dentistry.^[9]

By nature of their general training, dentists, without specialization can carry out the majority of dental treatments such as restorative (fillings, crowns, bridges), prosthetic (dentures), endodontic (root canal) therapy, periodontal (gum) therapy, and extraction of teeth, as well as performing examinations, radiographs (x-rays), and diagnosis. Dentists can also prescribe medications used in the field such as antibiotics, sedatives, and any other drugs used in patient management. Depending on their licensing boards, general dentists may be required to complete additional training to perform sedation, dental implants, etc.



Irreversible enamel defects caused by an untreated celiac disease. They may be the only clue to its diagnosis, even in absence of gastrointestinal symptoms, but are often

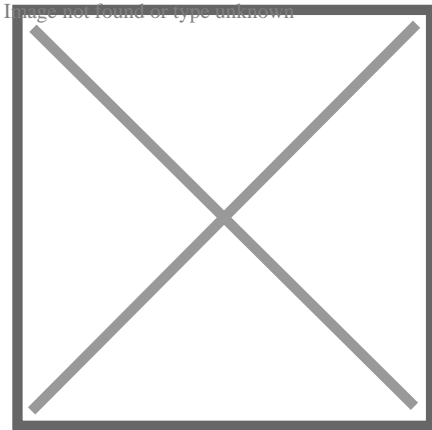
confused with fluorosis, tetracycline discoloration, acid reflux or other causes.^{[10][11][12]} The National Institutes of Health include a dental exam in the diagnostic protocol of celiac disease.^[10]

Dentists also encourage the prevention of oral diseases through proper hygiene and regular, twice or more yearly, checkups for professional cleaning and evaluation. Oral infections and inflammations may affect overall health and conditions in the oral cavity may be indicative of systemic diseases, such as osteoporosis, diabetes, celiac disease or cancer.^{[7][10][13][14]} Many studies have also shown that gum disease is associated with an increased risk of diabetes, heart disease, and preterm birth. The concept that oral health can affect systemic health and disease is referred to as "oral-systemic health".

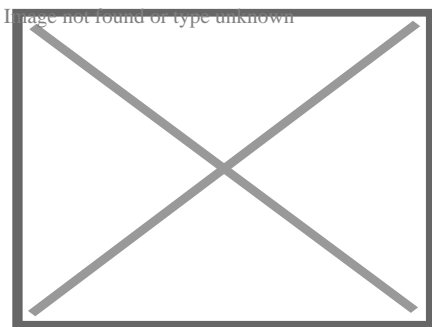
Education and licensing

[edit]

Main article: Dentistry throughout the world



A sagittal cross-section of a molar tooth; 1: crown, 2: root, 3: enamel, 4: dentin and dentin tubules, 5: pulp chamber, 6: blood vessels and nerve, 7: periodontal ligament, 8: apex and periapical region, 9: alveolar bone



Early dental chair in Pioneer West Museum in Shamrock, Texas

John M. Harris started the world's first dental school in Bainbridge, Ohio, and helped to establish dentistry as a health profession. It opened on 21 February 1828, and today is a dental museum.^[15] The first dental college, Baltimore College of Dental Surgery, opened in Baltimore, Maryland, US in 1840. The second in the United States was the Ohio College of Dental Surgery, established in

Cincinnati, Ohio, in 1845.^[16] The Philadelphia College of Dental Surgery followed in 1852.^[17] In 1907, Temple University accepted a bid to incorporate the school.

Studies show that dentists that graduated from different countries,^[18] or even from different dental schools in one country,^[19] may make different clinical decisions for the same clinical condition. For example, dentists that graduated from Israeli dental schools may recommend the removal of asymptomatic impacted third molar (wisdom teeth) more often than dentists that graduated from Latin American or Eastern European dental schools.^[20]

In the United Kingdom, the first dental schools, the London School of Dental Surgery and the Metropolitan School of Dental Science, both in London, opened in 1859.^[21] The British Dentists Act of 1878 and the 1879 Dentists Register limited the title of "dentist" and "dental surgeon" to qualified and registered practitioners.^{[22][23]} However, others could legally describe themselves as "dental experts" or "dental consultants".^[24] The practice of dentistry in the United Kingdom became fully regulated with the 1921 Dentists Act, which required the registration of anyone practising dentistry.^[25] The British Dental Association, formed in 1880 with Sir John Tomes as president, played a major role in prosecuting dentists practising illegally.^[22] Dentists in the United Kingdom are now regulated by the General Dental Council.

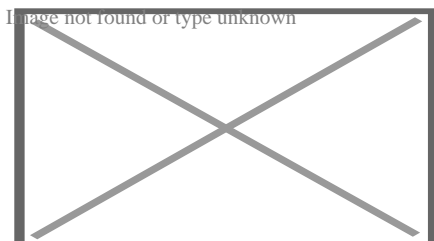
In many countries, dentists usually complete between five and eight years of post-secondary education before practising. Though not mandatory, many dentists choose to complete an internship or residency focusing on specific aspects of dental care after they have received their dental degree. In a few countries, to become a qualified dentist one must usually complete at least four years of postgraduate study;^[26] Dental degrees awarded around the world include the Doctor of Dental Surgery (DDS) and Doctor of Dental Medicine (DMD) in North America (US and Canada), and the Bachelor of Dental Surgery/Baccalaureus Dentalis Chirurgiae (BDS, BDent, BChD, BDS_c) in the UK and current and former British Commonwealth countries.

All dentists in the United States undergo at least three years of undergraduate studies, but nearly all complete a bachelor's degree. This schooling is followed by four years of dental school to qualify as a "Doctor of Dental Surgery" (DDS) or "Doctor of Dental Medicine" (DMD). Specialization in dentistry is available in the fields of Anesthesiology, Dental Public Health, Endodontics, Oral Radiology, Oral and Maxillofacial Surgery, Oral Medicine, Orofacial Pain, Pathology, Orthodontics, Pediatric Dentistry (Pedodontics), Periodontics, and Prosthodontics^[27]

Specialties

[edit]

Main article: Specialty (dentistry)



A modern dental clinic in Lappeenranta, Finland

Some dentists undertake further training after their initial degree in order to specialize. Exactly which subjects are recognized by dental registration bodies varies according to location. Examples include:

- Anesthesiology^[28] – The specialty of dentistry that deals with the advanced use of general anesthesia, sedation and pain management to facilitate dental procedures.
- Cosmetic dentistry – Focuses on improving the appearance of the mouth, teeth and smile.
- Dental public health – The study of epidemiology and social health policies relevant to oral health.
- Endodontics (also called *endodontology*) – Root canal therapy and study of diseases of the dental pulp and periapical tissues.
- Forensic odontology – The gathering and use of dental evidence in law. This may be performed by any dentist with experience or training in this field. The function of the forensic dentist is primarily documentation and verification of identity.
- Geriatric dentistry or *geriodontics* – The delivery of dental care to older adults involving the diagnosis, prevention, and treatment of problems associated with normal aging and age-related diseases as part of an interdisciplinary team with other health care professionals.
- Oral and maxillofacial pathology – The study, diagnosis, and sometimes the treatment of oral and maxillofacial related diseases.
- Oral and maxillofacial radiology – The study and radiologic interpretation of oral and maxillofacial diseases.
- Oral and maxillofacial surgery (also called *oral surgery*) – Extractions, implants, and surgery of the jaws, mouth and face.^[nb 2]
- Oral biology – Research in dental and craniofacial biology
- Oral Implantology – The art and science of replacing extracted teeth with dental implants.
- Oral medicine – The clinical evaluation and diagnosis of oral mucosal diseases
- Orthodontics and dentofacial orthopedics – The straightening of teeth and modification of midface and mandibular growth.
- Pediatric dentistry (also called *pedodontics*) – Dentistry for children
- Periodontology (also called *periodontics*) – The study and treatment of diseases of the periodontium (non-surgical and surgical) as well as placement and maintenance of dental implants
- Prosthodontics (also called *prosthetic dentistry*) – Dentures, bridges and the restoration of implants.
 - Some prosthodontists super-specialize in maxillofacial prosthetics, which is the discipline originally concerned with the rehabilitation of patients with congenital facial and oral defects such as cleft lip and palate or patients born with an underdeveloped ear (microtia). Today, most maxillofacial prosthodontists return function and esthetics to patients with acquired defects secondary to surgical removal of head and neck tumors, or secondary to trauma from war or motor vehicle accidents.
- Special needs dentistry (also called *special care dentistry*) – Dentistry for those with developmental and acquired disabilities.
- Sports dentistry – the branch of sports medicine dealing with prevention and treatment of dental injuries and oral diseases associated with sports and exercise.^[29] The sports dentist

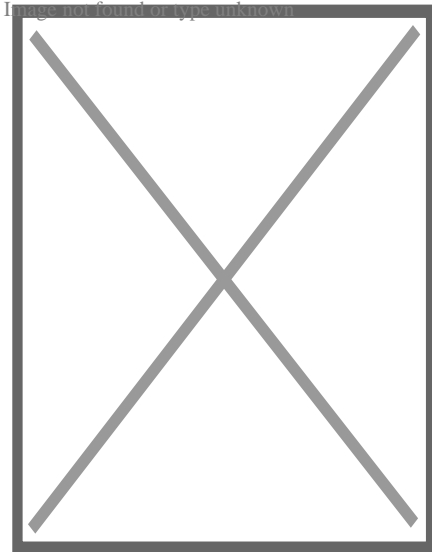
works as an individual consultant or as a member of the Sports Medicine Team.

- o Veterinary dentistry – The field of dentistry applied to the care of animals. It is a specialty of veterinary medicine.^{[30][31]}

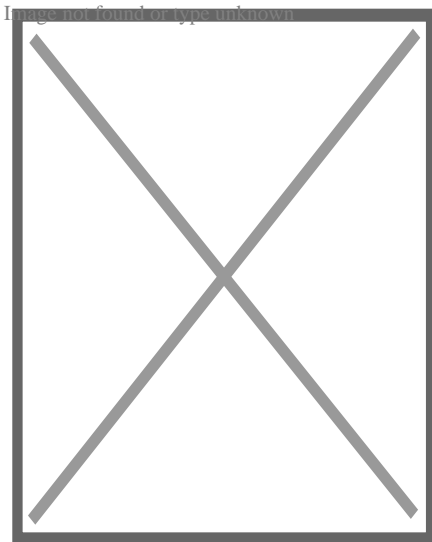
History

[edit]

See also: History of dental treatments



A wealthy patient falling over because of having a tooth extracted with such vigour by a fashionable dentist, c. 1790. History of Dentistry.



Farmer at the dentist, Johann Liss, c. 1616–17

Tooth decay was low in pre-agricultural societies, but the advent of farming society about 10,000 years ago correlated with an increase in tooth decay (cavities).^[32] An infected tooth from Italy partially cleaned with flint tools, between 13,820 and 14,160 years old, represents the oldest known dentistry,^[33] although a 2017 study suggests that 130,000 years ago the Neanderthals

already used rudimentary dentistry tools.^[34] In Italy evidence dated to the Paleolithic, around 13,000 years ago, points to bitumen used to fill a tooth^[35] and in Neolithic Slovenia, 6500 years ago, beeswax was used to close a fracture in a tooth.^[36] The Indus valley has yielded evidence of dentistry being practised as far back as 7000 BC, during the Stone Age.^[37] The Neolithic site of Mehrgarh (now in Pakistan's south western province of Balochistan) indicates that this form of dentistry involved curing tooth related disorders with bow drills operated, perhaps, by skilled bead-crafters.^[3] The reconstruction of this ancient form of dentistry showed that the methods used were reliable and effective.^[38] The earliest dental filling, made of beeswax, was discovered in Slovenia and dates from 6500 years ago.^[39] Dentistry was practised in prehistoric Malta, as evidenced by a skull which had a dental abscess lanced from the root of a tooth dating back to around 2500 BC.^[40]

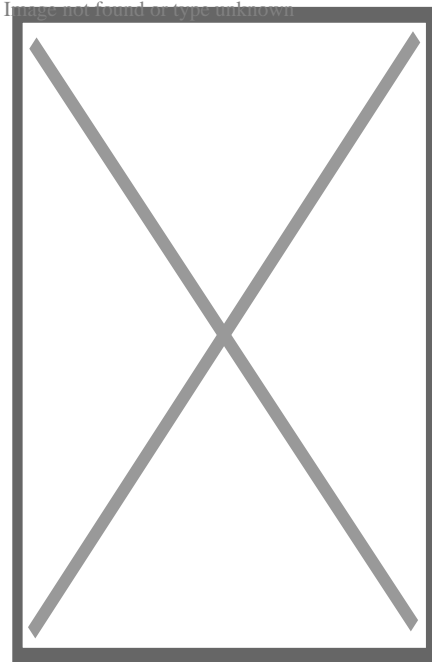
An ancient Sumerian text describes a "tooth worm" as the cause of dental caries.^[41] Evidence of this belief has also been found in ancient India, Egypt, Japan, and China. The legend of the worm is also found in the *Homeric Hymns*,^[42] and as late as the 14th century AD the surgeon Guy de Chauliac still promoted the belief that worms cause tooth decay.^[43]

Recipes for the treatment of toothache, infections and loose teeth are spread throughout the Ebers Papyrus, Kahun Papyri, Brugsch Papyrus, and Hearst papyrus of Ancient Egypt.^[44] The Edwin Smith Papyrus, written in the 17th century BC but which may reflect previous manuscripts from as early as 3000 BC, discusses the treatment of dislocated or fractured jaws.^{[44][45]} In the 18th century BC, the Code of Hammurabi referenced dental extraction twice as it related to punishment.^[46] Examination of the remains of some ancient Egyptians and Greco-Romans reveals early attempts at dental prosthetics.^[47] However, it is possible the prosthetics were prepared after death for aesthetic reasons.^[44]

Ancient Greek scholars Hippocrates and Aristotle wrote about dentistry, including the eruption pattern of teeth, treating decayed teeth and gum disease, extracting teeth with forceps, and using wires to stabilize loose teeth and fractured jaws.^[48] Use of dental appliances, bridges and dentures was applied by the Etruscans in northern Italy, from as early as 700 BC, of human or other animal teeth fastened together with gold bands.^{[49][50][51]} The Romans had likely borrowed this technique by the 5th century BC.^{[50][52]} The Phoenicians crafted dentures during the 6th–4th century BC, fashioning them from gold wire and incorporating two ivory teeth.^[53] In ancient Egypt, Hesy-Ra is the first named "dentist" (greatest of the teeth). The Egyptians bound replacement teeth together with gold wire. Roman medical writer Cornelius Celsus wrote extensively of oral diseases as well as dental treatments such as narcotic-containing emollients and astringents.^[54] The earliest dental amalgams were first documented in a Tang dynasty medical text written by the Chinese physician Su Kung in 659, and appeared in Germany in 1528.^{[55][56]}

During the Islamic Golden Age Dentistry was discussed in several famous books of medicine such as *The Canon in medicine* written by Avicenna and *Al-Tasreef* by Al-Zahrawi who is considered the greatest surgeon of the Middle Ages.^[57] Avicenna said that jaw fracture should be reduced according to the occlusal guidance of the teeth; this principle is still valid in modern times. Al-Zahrawi invented over 200 surgical tools that resemble the modern kind.^[58]

Historically, dental extractions have been used to treat a variety of illnesses. During the Middle Ages and throughout the 19th century, dentistry was not a profession in itself, and often dental procedures were performed by barbers or general physicians. Barbers usually limited their practice to extracting teeth which alleviated pain and associated chronic tooth infection. Instruments used for dental extractions date back several centuries. In the 14th century, Guy de Chauliac most probably invented the dental pelican^[59] (resembling a pelican's beak) which was used to perform dental extractions up until the late 18th century. The pelican was replaced by the dental key^[60] which, in turn, was replaced by modern forceps in the 19th century.^[61]



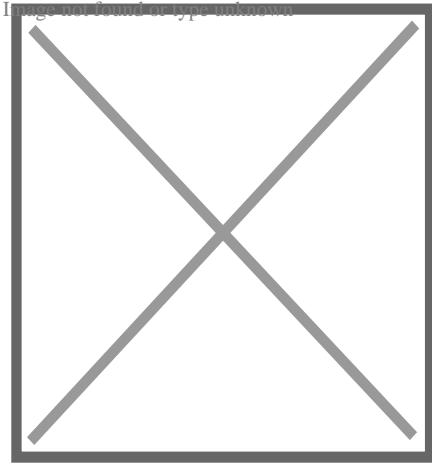
Dental needle-nose pliers designed by Fauchard in the late 17th century to use in prosthodontics

The first book focused solely on dentistry was the "Artzney Buchlein" in 1530^[48] and the first dental textbook written in English was called "Operator for the Teeth" by Charles Allen in 1685^[23]

In the United Kingdom, there was no formal qualification for the providers of dental treatment until 1859 and it was only in 1921 that the practice of dentistry was limited to those who were professionally qualified. The Royal Commission on the National Health Service in 1979 reported that there were then more than twice as many registered dentists per 10,000 population in the UK than there were in 1921.^[62]

Modern dentistry

[edit]

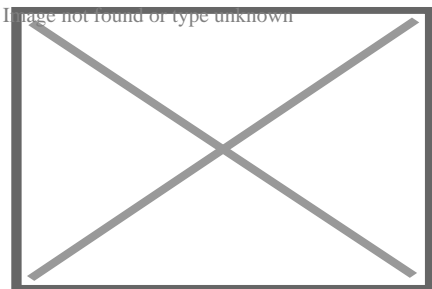


A microscopic device used in dental analysis, c. 1907

It was between 1650 and 1800 that the science of modern dentistry developed. The English physician Thomas Browne in his *A Letter to a Friend* (c. 1656 pub. 1690) made an early dental observation with characteristic humour:

The Egyptian Mummies that I have seen, have had their Mouths open, and somewhat gaping, which affordeth a good opportunity to view and observe their Teeth, wherein 'tis not easie to find any wanting or decayed: and therefore in Egypt, where one Man practised but one Operation, or the Diseases but of single Parts, it must needs be a barren Profession to confine unto that of drawing of Teeth, and little better than to have been Tooth-drawer unto King Pyrrhus, who had but two in his Head.

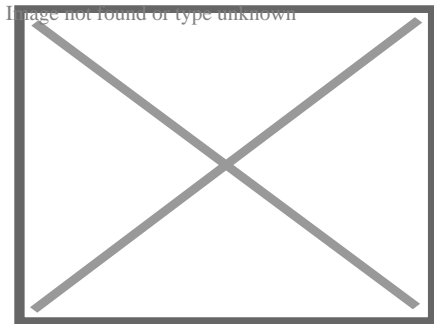
The French surgeon Pierre Fauchard became known as the "father of modern dentistry". Despite the limitations of the primitive surgical instruments during the late 17th and early 18th century, Fauchard was a highly skilled surgeon who made remarkable improvisations of dental instruments, often adapting tools from watchmakers, jewelers and even barbers, that he thought could be used in dentistry. He introduced dental fillings as treatment for dental cavities. He asserted that sugar-derived acids like tartaric acid were responsible for dental decay, and also suggested that tumors surrounding the teeth and in the gums could appear in the later stages of tooth decay.^{[63][64]}



Panoramic radiograph of historic dental implants, made 1978

Fauchard was the pioneer of dental prosthesis, and he invented many methods to replace lost teeth. He suggested that substitutes could be made from carved blocks of ivory or bone. He also introduced dental braces, although they were initially made of gold, he discovered that the teeth position could be corrected as the teeth would follow the pattern of the wires. Waxed linen or silk

threads were usually employed to fasten the braces. His contributions to the world of dental science consist primarily of his 1728 publication *Le chirurgien dentiste* or *The Surgeon Dentist*. The French text included "basic oral anatomy and function, dental construction, and various operative and restorative techniques, and effectively separated dentistry from the wider category of surgery".^[63]^[64]



A modern dentist's chair

After Fauchard, the study of dentistry rapidly expanded. Two important books, *Natural History of Human Teeth* (1771) and *Practical Treatise on the Diseases of the Teeth* (1778), were published by British surgeon John Hunter. In 1763, he entered into a period of collaboration with the London-based dentist James Spence. He began to theorise about the possibility of tooth transplants from one person to another. He realised that the chances of a successful tooth transplant (initially, at least) would be improved if the donor tooth was as fresh as possible and was matched for size with the recipient. These principles are still used in the transplantation of internal organs. Hunter conducted a series of pioneering operations, in which he attempted a tooth transplant. Although the donated teeth never properly bonded with the recipients' gums, one of Hunter's patients stated that he had three which lasted for six years, a remarkable achievement for the period.^[65]

Major advances in science were made in the 19th century, and dentistry evolved from a trade to a profession. The profession came under government regulation by the end of the 19th century. In the UK, the Dentist Act was passed in 1878 and the British Dental Association formed in 1879. In the same year, Francis Brodie Imlach was the first ever dentist to be elected President of the Royal College of Surgeons (Edinburgh), raising dentistry onto a par with clinical surgery for the first time.^[66]

Hazards in modern dentistry

[edit]

Main article: Occupational hazards in dentistry

Long term occupational noise exposure can contribute to permanent hearing loss, which is referred to as noise-induced hearing loss (NIHL) and tinnitus. Noise exposure can cause excessive stimulation of the hearing mechanism, which damages the delicate structures of the inner ear.^[67] NIHL can occur when an individual is exposed to sound levels above 90 dBA according to the Occupational Safety and Health Administration (OSHA). Regulations state that

the permissible noise exposure levels for individuals is 90 dBA.^[68] For the National Institute for Occupational Safety and Health (NIOSH), exposure limits are set to 85 dBA. Exposures below 85 dBA are not considered to be hazardous. Time limits are placed on how long an individual can stay in an environment above 85 dBA before it causes hearing loss. OSHA places that limitation at 8 hours for 85 dBA. The exposure time becomes shorter as the dBA level increases.

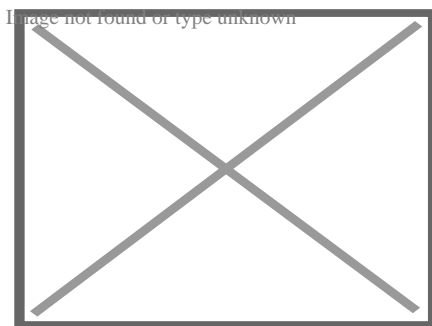
Within the field of dentistry, a variety of cleaning tools are used including piezoelectric and sonic scalers, and ultrasonic scalers and cleaners.^[69] While a majority of the tools do not exceed 75 dBA,^[70] prolonged exposure over many years can lead to hearing loss or complaints of tinnitus.^[71] Few dentists have reported using personal hearing protective devices,^[72]^[73] which could offset any potential hearing loss or tinnitus.

Evidence-based dentistry

[edit]

Main article: Evidence-based dentistry

There is a movement in modern dentistry to place a greater emphasis on high-quality scientific evidence in decision-making. Evidence-based dentistry (EBD) uses current scientific evidence to guide decisions. It is an approach to oral health that requires the application and examination of relevant scientific data related to the patient's oral and medical health. Along with the dentist's professional skill and expertise, EBD allows dentists to stay up to date on the latest procedures and patients to receive improved treatment. A new paradigm for medical education designed to incorporate current research into education and practice was developed to help practitioners provide the best care for their patients.^[74] It was first introduced by Gordon Guyatt and the Evidence-Based Medicine Working Group at McMaster University in Ontario, Canada in the 1990s. It is part of the larger movement toward evidence-based medicine and other evidence-based practices, especially since a major part of dentistry involves dealing with oral and systemic diseases. Other issues relevant to the dental field in terms of evidence-based research and evidence-based practice include population oral health, dental clinical practice, tooth morphology etc.



A dental chair at the University of Michigan School of Dentistry

Ethical and medicolegal issues

[edit]

Dentistry is unique in that it requires dental students to have competence-based clinical skills that can only be acquired through supervised specialized laboratory training and direct patient care^[75] This necessitates the need for a scientific and professional basis of care with a foundation of extensive research-based education.^[76] According to some experts, the accreditation of dental schools can enhance the quality and professionalism of dental education.^[77]^[78]

See also

[edit]

- icon Image of a medicine portal
 - Medicine portal
- Dental aerosol
- Dental instrument
- Dental public health
- Domestic healthcare:
 - Dentistry in ancient Rome
 - Dentistry in Canada
 - Dentistry in the Philippines
 - Dentistry in Israel
 - Dentistry in the United Kingdom
 - Dentistry in the United States
- Eco-friendly dentistry
- Geriatric dentistry
- List of dental organizations
- Pediatric dentistry
- Sustainable dentistry
- Veterinary dentistry

Notes

[edit]

- [^] Whether Dentists are referred to as "Doctor" is subject to geographic variation. For example, they are called "Doctor" in the US. In the UK, dentists have traditionally been referred to as "Mister" as they identified themselves with barber surgeons more than physicians (as do surgeons in the UK, see Surgeon#Titles). However more UK dentists now refer to themselves as "Doctor", although this was considered to be potentially misleading by the British public in a single report (see Costley and Fawcett 2010).

2. ^ The scope of oral and maxillofacial surgery is variable. In some countries, both a medical and dental degree is required for training, and the scope includes head and neck oncology and craniofacial deformity.

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Dentistry

Specialties

- Endodontics
- Oral and maxillofacial pathology
- Oral and maxillofacial radiology
- Oral and maxillofacial surgery
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- Pediatric dentistry
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- Prosthodontics
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- Geriatric dentistry
- Restorative dentistry
- Forensic odontology
- Dental traumatology
- Holistic dentistry

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- Teeth cleaning
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- Tooth bleaching
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- British Dental Health Foundation
- British Orthodontic Society
- Canadian Association of Orthodontists
- Dental Technologists Association
- General Dental Council
- Indian Dental Association
- National Health Service

- By country**
- Canada
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- See also**
- Index of oral health and dental articles
 - Outline of dentistry and oral health
 - Dental fear
 - Dental instruments
 - Dental material
 - History of dental treatments
 - Ancient Rome
 - Infant oral mutilation
 - Mouth assessment
 - Oral hygiene

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Cleft lip and cleft palate

- Related specialities**
- Advance practice nursing
 - Audiology
 - Dentistry
 - Dietetics
 - Genetics
 - Oral and maxillofacial surgery
 - Orthodontics
 - Orthodontic technology
 - Otolaryngology
 - Pediatrics
 - Pediatric dentistry
 - Physician
 - Plastic surgery
 - Psychiatry
 - Psychology
 - Respiratory therapy
 - Social work
 - Speech and language therapy

Related syndromes

- Hearing loss with craniofacial syndromes
- Pierre Robin syndrome
- Popliteal pterygium syndrome
- Van der Woude syndrome

National and international organisations

- Cleft Lip and Palate Association
- Craniofacial Society of Great Britain and Ireland
- Interplast
- North Thames Regional Cleft Lip and Palate Service
- Operation Smile
- Overseas Plastic Surgery Appeal
- Shriners Hospitals for Children
- Smile Train
- Transforming Faces Worldwide
- Smile Angel Foundation (China)

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Dental schools

**American
dental
schools**

- UAB
- Arizona
- Augusta (DCG)
- Boston U (Goldman)
- California (UCLA, UCSF)
- Case Western Reserve
- Colorado
- Columbia
- Connecticut
- Creighton
- Detroit Mercy
- East Carolina
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- Harvard
- Howard
- Illinois–Chicago
- Indiana
- Iowa
- Kentucky
- Lake Erie
- Loma Linda
- Louisville
- LSU Health–New Orleans
- Marquette
- Maryland–Baltimore
- Meharry
- Michigan
- Midwestern
- Minnesota
- Mississippi
- Missouri–Kansas City
- Nebraska–Medical Center
- Nevada–Las Vegas
- New England
- NYU
- SUNY (Buffalo, Stony Brook)
- North Carolina
- Nova
- Ohio State
- Oklahoma
- Oregon
- Pacific (Dugoni)

- Penn
- Pitt
- Puerto Rico
- Rochester
- Pacific Northwest
- Rutgers

**Defunct
American
dental
schools**

- Emory
- Fairleigh Dickinson
- Georgetown
- Harris
- Loyola
- Northwestern
- Ohio College
- Oral Roberts
- Pennsylvania College
- Wash U

**Canadian
dental
schools**

- Alberta
- British Columbia
- Dalhousie
- Laval
- Manitoba
- McGill
- Montréal
- Saskatchewan
- Toronto
- Western

**British
dental
schools**

- Aberdeen
- Barts and The London School of Medicine and Dentistry
- Glasgow
- Guy's, King's & St Thomas's
- Liverpool
- Newcastle
- Peninsula College of Medicine and Dentistry
- UCL Eastman Dental Institute

**Australian
and New
Zealand
dental
schools**

- Sydney
- Melbourne
- Adelaide
- Charles Sturt University
- Griffith University
- James Cook
- La Trobe
- Queensland
- Western Australia
- University of Otago

**South
Korean
dental
schools**

- Chonbuk
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- Chosun
- Dankook
- Gangneung-Wonju
- Kyung Hee
- Kyungpook
- Pusan
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- Wonkwang
- Yonsei

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Medicine

Surgery

- Cardiac surgery
- Cardiothoracic surgery
- Endocrine surgery
- Eye surgery
- General surgery
 - Colorectal surgery
 - Digestive system surgery
- Neurosurgery
- Oral and maxillofacial surgery
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- Infectious diseases
- Nephrology
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- Rheumatology

Obstetrics and gynaecology

- Gynaecology
- Gynecologic oncology
- Maternal–fetal medicine
- Obstetrics
- Reproductive endocrinology and infertility
- Urogynecology






- Radiology

Medical education

- Medical school
- Bachelor of Medicine, Bachelor of Surgery
- Bachelor of Medical Sciences
- Master of Medicine
- Master of Surgery
- Doctor of Medicine
- Doctor of Osteopathic Medicine
- MD–PhD
 - Medical Scientist Training Program

Related topics

- Alternative medicine
- Allied health
- Molecular oncology
- Nanomedicine
- Personalized medicine
- Public health
- Rural health
- Therapy
- Traditional medicine
- Veterinary medicine
- Physician
 - Chief physician
- History of medicine

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Other

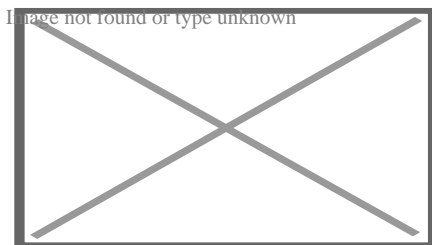
- Historical Dictionary of Switzerland
- NARA

About health professional

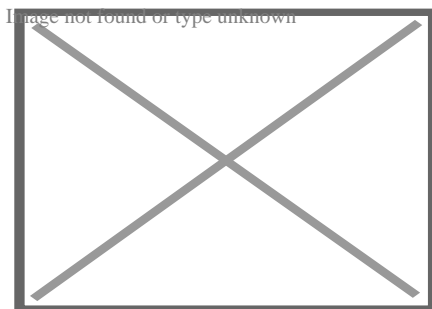
A **health professional**, **healthcare professional**, or **healthcare worker** (sometimes abbreviated **HCW**)[¹] is a provider of health care treatment and advice based on formal training and experience. The field includes those who work as a nurse, physician (such as family physician, internist, obstetrician, psychiatrist, radiologist, surgeon etc.), physician assistant, registered dietitian, veterinarian, veterinary technician, optometrist, pharmacist, pharmacy technician, medical assistant, physical therapist, occupational therapist, dentist, midwife, psychologist, audiologist, or healthcare scientist, or who perform services in allied health professions. Experts in public health and community health are also health professionals.

Fields

[edit]



NY College of Health Professions massage therapy class

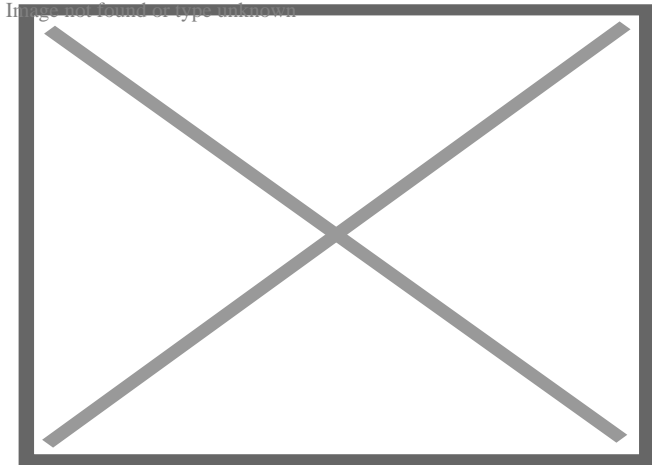


US Navy doctors deliver a healthy baby

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Health practitioners and professionals

- Athletic trainer
- Audiologist
- Chiropractor
- Clinical coder
- Clinical nurse specialist
- Clinical officer
- Community health worker
- Dentist
- Dietitian and nutritionist
- Emergency medical technician
- Feldsher
- Health administrator
- Medical assistant
- Medical laboratory scientist
- Medical transcriptionist
- Nurse anesthetist
- Nurse practitioner
- Nurse midwife
- Nurse
- Occupational Therapist
- Optometrist
- Paramedic
- Pharmacist
- Pharmaconomist
- Pharmacy technician
- Phlebotomist
- Physician
- Physician assistant
- Podiatrist
- Psychologist
- Psychotherapist
- Physical therapist
- Radiographer
- Radiotherapist
- Respiratory therapist
- Speech-language pathologist
- Social Work
- Surgeon
- Surgeon's assistant
- Surgical technologist



70% of global health and social care workers are women, 30% of leaders in the global health sector are women

The healthcare workforce comprises a wide variety of professions and occupations who provide some type of healthcare service, including such direct care practitioners as physicians, nurse practitioners, physician assistants, nurses, respiratory therapists, dentists, pharmacists, speech-language pathologist, physical therapists, occupational therapists, physical and behavior therapists, as well as allied health professionals such as phlebotomists, medical laboratory scientists, dieticians, and social workers. They often work in hospitals, healthcare centers and other service delivery points, but also in academic training, research, and administration. Some provide care and treatment services for patients in private homes. Many countries have a large number of community health workers who work outside formal healthcare institutions. Managers of healthcare services, health information technicians, and other assistive personnel and support workers are also considered a vital part of health care teams.^[2]

Healthcare practitioners are commonly grouped into health professions. Within each field of expertise, practitioners are often classified according to skill level and skill specialization. "Health professionals" are highly skilled workers, in professions that usually require extensive knowledge including university-level study leading to the award of a first degree or higher qualification.^[3] This category includes physicians, physician assistants, registered nurses, veterinarians, veterinary technicians, veterinary assistants, dentists, midwives, radiographers, pharmacists, physiotherapists, optometrists, operating department practitioners and others. Allied health professionals, also referred to as "health associate professionals" in the International Standard Classification of Occupations, support implementation of health care, treatment and referral plans usually established by medical, nursing, respiratory care, and other health professionals, and usually require formal qualifications to practice their profession. In addition, unlicensed assistive personnel assist with providing health care services as permitted.^[citation needed]

Another way to categorize healthcare practitioners is according to the sub-field in which they practice, such as mental health care, pregnancy and childbirth care, surgical care, rehabilitation care, or public health.^[citation needed]

Mental health

[edit]

Main article: Mental health professional

A mental health professional is a health worker who offers services to improve the mental health of individuals or treat mental illness. These include psychiatrists, psychiatry physician assistants, clinical, counseling, and school psychologists, occupational therapists, clinical social workers, psychiatric-mental health nurse practitioners, marriage and family therapists, mental health counselors, as well as other health professionals and allied health professions. These health care providers often deal with the same illnesses, disorders, conditions, and issues; however, their scope of practice often differs. The most significant difference across categories of mental health practitioners is education and training.^[4] There are many damaging effects to the health care workers. Many have had diverse negative psychological symptoms ranging from emotional trauma to very severe anxiety. Health care workers have not been treated right and because of that their mental, physical, and emotional health has been affected by it. The SAGE author's said that there were 94% of nurses that had experienced at least one PTSD after the traumatic experience. Others have experienced nightmares, flashbacks, and short and long term emotional reactions.^[5] The abuse is causing detrimental effects on these health care workers. Violence is causing health care workers to have a negative attitude toward work tasks and patients, and because of that they are "feeling pressured to accept the order, dispense a product, or administer a medication"^[6] Sometimes it can range from verbal to sexual to physical harassment, whether the abuser is a patient, patient's families, physician, supervisors, or nurses.^[citation needed]

Obstetrics

[edit]

Main articles: Obstetrics, Midwifery, and Birth attendant

A maternal and newborn health practitioner is a health care expert who deals with the care of women and their children before, during and after pregnancy and childbirth. Such health practitioners include obstetricians, physician assistants, midwives, obstetrical nurses and many others. One of the main differences between these professions is in the training and authority to provide surgical services and other life-saving interventions.^[7] In some developing countries, traditional birth attendants, or traditional midwives, are the primary source of pregnancy and childbirth care for many women and families, although they are not certified or licensed. According to research, rates for unhappiness among obstetrician-gynecologists (Ob-Gyns) range somewhere between 40 and 75 percent.^[8]

Geriatrics

[edit]

Main articles: Geriatrics and Geriatric care management

A geriatric care practitioner plans and coordinates the care of the elderly and/or disabled to promote their health, improve their quality of life, and maintain their independence for as long as possible.^[9] They include geriatricians, occupational therapists, physician assistants, adult-gerontology nurse practitioners, clinical nurse specialists, geriatric clinical pharmacists, geriatric nurses, geriatric care managers, geriatric aides, nursing aides, caregivers and others who focus on the health and psychological care needs of older adults.^[citation needed]

Surgery

[edit]

A surgical practitioner is a healthcare professional and expert who specializes in the planning and delivery of a patient's perioperative care, including during the anaesthetic, surgical and recovery stages. They may include general and specialist surgeons, physician assistants, assistant surgeons, surgical assistants, veterinary surgeons, veterinary technicians, anesthesiologists, anesthesiologist assistants, nurse anesthetists, surgical nurses, clinical officers, operating department practitioners, anaesthetic technicians, perioperative nurses, surgical technologists, and others.^[citation needed]

Rehabilitation

[edit]

A rehabilitation care practitioner is a health worker who provides care and treatment which aims to enhance and restore functional ability and quality of life to those with physical impairments or disabilities. These include physiatrists, physician assistants, rehabilitation nurses, clinical nurse specialists, nurse practitioners, physiotherapists, chiropractors, orthotists, prosthetists, occupational therapists, recreational therapists, audiologists, speech and language pathologists, respiratory therapists, rehabilitation counsellors, physical rehabilitation therapists, athletic trainers, physiotherapy technicians, orthotic technicians, prosthetic technicians, personal care assistants, and others.^[10]

Optometry

[edit]

Main article: Optometry

Optometry is a field traditionally associated with the correction of refractive errors using glasses or contact lenses, and treating eye diseases. Optometrists also provide general eye care, including screening exams for glaucoma and diabetic retinopathy and management of routine or eye conditions. Optometrists may also undergo further training in order to specialize in various fields, including glaucoma, medical retina, low vision, or paediatrics. In some countries, such as the United Kingdom, United States, and Canada, Optometrists may also undergo further training in order to be able to perform some surgical procedures.

Diagnostics

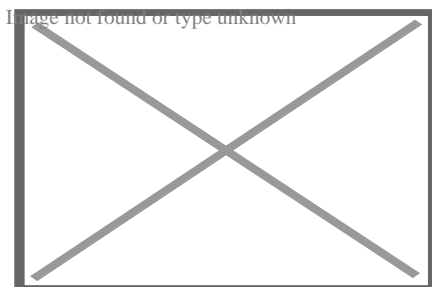
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Main article: Medical diagnosis

Medical diagnosis providers are health workers responsible for the process of determining which disease or condition explains a person's symptoms and signs. It is most often referred to as diagnosis with the medical context being implicit. This usually involves a team of healthcare providers in various diagnostic units. These include radiographers, radiologists, Sonographers, medical laboratory scientists, pathologists, and related professionals.^{*[citation needed]*}

Dentistry

[edit]



Dental assistant on the right supporting a dental operator on the left, during a procedure.

Main article: Dentistry

A dental care practitioner is a health worker and expert who provides care and treatment to promote and restore oral health. These include dentists and dental surgeons, dental assistants, dental auxiliaries, dental hygienists, dental nurses, dental technicians, dental therapists or oral health therapists, and related professionals.

Podiatry

[edit]

Care and treatment for the foot, ankle, and lower leg may be delivered by podiatrists, chiroprodists, pedorthists, foot health practitioners, podiatric medical assistants, podiatric nurse and others.

Public health

[edit]

A public health practitioner focuses on improving health among individuals, families and communities through the prevention and treatment of diseases and injuries, surveillance of cases, and promotion of healthy behaviors. This category includes community and preventive medicine specialists, physician assistants, public health nurses, pharmacist, clinical nurse specialists, dietitians, environmental health officers (public health inspectors), paramedics, epidemiologists, public health dentists, and others.^[*citation needed*]

Alternative medicine

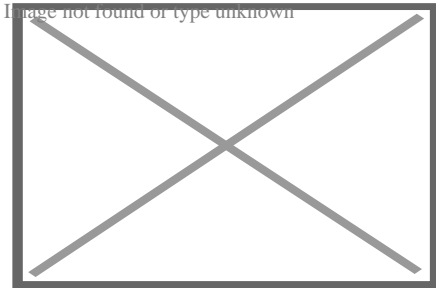
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In many societies, practitioners of alternative medicine have contact with a significant number of people, either as integrated within or remaining outside the formal health care system. These include practitioners in acupuncture, Ayurveda, herbalism, homeopathy, naturopathy, Reiki, Shamballa Reiki energy healing Archived 2021-01-25 at the Wayback Machine, Siddha medicine, traditional Chinese medicine, traditional Korean medicine, Unani, and Yoga. In some countries such as Canada, chiropractors and osteopaths (not to be confused with doctors of osteopathic medicine in the United States) are considered alternative medicine practitioners.

Occupational hazards

[edit]

See also: Occupational hazards in dentistry and Nursing § Occupational hazards



A healthcare professional wears an air sampling device to investigate exposure to airborne influenza

A video describing the Occupational Health and Safety Network, a tool for monitoring occupational hazards to health care workers

The healthcare workforce faces unique health and safety challenges and is recognized by the National Institute for Occupational Safety and Health (NIOSH) as a priority industry sector in the National Occupational Research Agenda (NORA) to identify and provide intervention strategies regarding occupational health and safety issues.^[11]

Biological hazards

[edit]

Exposure to respiratory infectious diseases like tuberculosis (caused by *Mycobacterium tuberculosis*) and influenza can be reduced with the use of respirators; this exposure is a significant occupational hazard for health care professionals.^[12] Healthcare workers are also at risk for diseases that are contracted through extended contact with a patient, including scabies.^[13] Health professionals are also at risk for contracting blood-borne diseases like hepatitis B, hepatitis C, and HIV/AIDS through needlestick injuries or contact with bodily fluids.^{[14][15]} This risk can be mitigated with vaccination when there is a vaccine available, like with hepatitis B.^[15] In epidemic situations, such as the 2014-2016 West African Ebola virus epidemic or the 2003 SARS outbreak, healthcare workers are at even greater risk, and were disproportionately affected in both the Ebola and SARS outbreaks.^[16]

In general, appropriate personal protective equipment (PPE) is the first-line mode of protection for healthcare workers from infectious diseases. For it to be effective against highly contagious diseases, personal protective equipment must be watertight and prevent the skin and mucous membranes from contacting infectious material. Different levels of personal protective equipment created to unique standards are used in situations where the risk of infection is different. Practices such as triple gloving and multiple respirators do not provide a higher level of protection and present a burden to the worker, who is additionally at increased risk of exposure when removing the PPE. Compliance with appropriate personal protective equipment rules may be difficult in

certain situations, such as tropical environments or low-resource settings. A 2020 Cochrane systematic review found low-quality evidence that using more breathable fabric in PPE, double gloving, and active training reduce the risk of contamination but that more randomized controlled trials are needed for how best to train healthcare workers in proper PPE use.^[16]

Tuberculosis screening, testing, and education

[edit]

Based on recommendations from The United States Center for Disease Control and Prevention (CDC) for TB screening and testing the following best practices should be followed when hiring and employing Health Care Personnel.^[17]

When hiring Health Care Personnel, the applicant should complete the following^[18] a TB risk assessment,^[19] a TB symptom evaluation for at least those listed on the Signs & Symptoms page,^[20] a TB test in accordance with the guidelines for Testing for TB Infection,^[21] and additional evaluation for TB disease as needed (e.g. chest x-ray for HCP with a positive TB test)^[18] The CDC recommends either a blood test, also known as an interferon-gamma release assay (IGRA), or a skin test, also known as a Mantoux tuberculin skin test (TST).^[21] A TB blood test for baseline testing does not require two-step testing. If the skin test method is used to test HCP upon hire, then two-step testing should be used. A one-step test is not recommended.^[18]

The CDC has outlined further specifics on recommended testing for several scenarios^[22] In summary:

1. Previous documented positive skin test (TST) then a further TST is not recommended
2. Previous documented negative TST within 12 months before employment OR at least two documented negative TSTs ever then a single TST is recommended
3. All other scenarios, with the exception of programs using blood tests, the recommended testing is a two-step TST

According to these recommended testing guidelines any two negative TST results within 12 months of each other constitute a two-step TST.

For annual screening, testing, and education, the only recurring requirement for all HCP is to receive TB education annually.^[18] While the CDC offers education materials, there is not a well defined requirement as to what constitutes a satisfactory annual education. Annual TB testing is no longer recommended unless there is a known exposure or ongoing transmission at a healthcare facility. Should an HCP be considered at increased occupational risk for TB annual screening may be considered. For HCP with a documented history of a positive TB test result do not need to be re-tested but should instead complete a TB symptom evaluation. It is assumed that any HCP who has undergone a chest x-ray test has had a previous positive test result. When considering mental health you may see your doctor to be evaluated at your digression. It is recommended to see someone at least once a year in order to make sure that there has not been any sudden changes^[23]

Psychosocial hazards

[edit]

Occupational stress and occupational burnout are highly prevalent among health professionals^[24] Some studies suggest that workplace stress is pervasive in the health care industry because of inadequate staffing levels, long work hours, exposure to infectious diseases and hazardous substances leading to illness or death, and in some countries threat of malpractice litigation. Other stressors include the emotional labor of caring for ill people and high patient loads. The consequences of this stress can include substance abuse, suicide, major depressive disorder, and anxiety, all of which occur at higher rates in health professionals than the general working population. Elevated levels of stress are also linked to high rates of burnout, absenteeism and diagnostic errors, and reduced rates of patient satisfaction.^[25] In Canada, a national report (*Canada's Health Care Providers*) also indicated higher rates of absenteeism due to illness or disability among health care workers compared to the rest of the working population, although those working in health care reported similar levels of good health and fewer reports of being injured at work.^[26]

There is some evidence that cognitive-behavioral therapy, relaxation training and therapy (including meditation and massage), and modifying schedules can reduce stress and burnout among multiple sectors of health care providers. Research is ongoing in this area, especially with regards to physicians, whose occupational stress and burnout is less researched compared to other health professions.^[27]

Healthcare workers are at higher risk of on-the-job injury due to violence. Drunk, confused, and hostile patients and visitors are a continual threat to providers attempting to treat patients. Frequently, assault and violence in a healthcare setting goes unreported and is wrongly assumed to be part of the job.^[28] Violent incidents typically occur during one-on-one care; being alone with patients increases healthcare workers' risk of assault.^[29] In the United States, healthcare workers experience 2/3 of nonfatal workplace violence incidents.^[28] Psychiatric units represent the highest proportion of violent incidents, at 40%; they are followed by geriatric units (20%) and the emergency department (10%). Workplace violence can also cause psychological trauma.^[29]

Health care professionals are also likely to experience sleep deprivation due to their jobs. Many health care professionals are on a shift work schedule, and therefore experience misalignment of their work schedule and their circadian rhythm. In 2007, 32% of healthcare workers were found to get fewer than 6 hours of sleep a night. Sleep deprivation also predisposes healthcare professionals to make mistakes that may potentially endanger a patient.^[30]

COVID pandemic

[edit]

Especially in times like the present (2020), the hazards of health professional stem into the mental health. Research from the last few months highlights that COVID-19 has contributed greatly to the degradation of mental health in healthcare providers. This includes, but is not limited to, anxiety, depression/burnout, and insomnia.^[citation needed]

A study done by Di Mattei et al. (2020) revealed that 12.63% of COVID nurses and 16.28% of other COVID healthcare workers reported extremely severe anxiety symptoms at the peak of the pandemic.^[31] In addition, another study was conducted on 1,448 full time employees in Japan. The participants were surveyed at baseline in March 2020 and then again in May 2020. The result of the study showed that psychological distress and anxiety had increased more among healthcare workers during the COVID-19 outbreak.^[32]

Similarly, studies have also shown that following the pandemic, at least one in five healthcare professionals report symptoms of anxiety.^[33] Specifically, the aspect of "anxiety was assessed in 12 studies, with a pooled prevalence of 23.2%" following COVID.^[33] When considering all 1,448 participants that percentage makes up about 335 people.

Abuse by patients

[edit]

- The patients are selecting victims who are more vulnerable. For example, Cho said that these would be the nurses that are lacking experience or trying to get used to their new roles at work.^[34]
- Others authors that agree with this are Vento, Cainelli, & Vallone and they said that, the reason patients have caused danger to health care workers is because of insufficient communication between them, long waiting lines, and overcrowding in waiting areas.^[35] When patients are intrusive and/or violent toward the faculty, this makes the staff question what they should do about taking care of a patient.
- There have been many incidents from patients that have really caused some health care workers to be traumatized and have so much self doubt. Goldblatt and other authors said that there was a lady who was giving birth, her husband said, "Who is in charge around here"? "Who are these sluts you employ here".^[5] This was very avoidable to have been said to the people who are taking care of your wife and child.

Physical and chemical hazards

[edit]

Slips, trips, and falls are the second-most common cause of worker's compensation claims in the US and cause 21% of work absences due to injury. These injuries most commonly result in strains and sprains; women, those older than 45, and those who have been working less than a year in a healthcare setting are at the highest risk.^[36]

An epidemiological study published in 2018 examined the hearing status of noise-exposed health care and social assistance (HSA) workers sector to estimate and compare the prevalence of hearing loss by subsector within the sector. Most of the HSA subsector prevalence estimates ranged from 14% to 18%, but the Medical and Diagnostic Laboratories subsector had 31% prevalence and the Offices of All Other Miscellaneous Health Practitioners had a 24% prevalence. The Child Day Care Services subsector also had a 52% higher risk than the reference industry.^[37]

Exposure to hazardous drugs, including those for chemotherapy, is another potential occupational risk. These drugs can cause cancer and other health conditions.^[38]

Gender factors

[edit]

Female health care workers may face specific types of workplace-related health conditions and stress. According to the World Health Organization, women predominate in the formal health workforce in many countries and are prone to musculoskeletal injury (caused by physically demanding job tasks such as lifting and moving patients) and burnout. Female health workers are exposed to hazardous drugs and chemicals in the workplace which may cause adverse reproductive outcomes such as spontaneous abortion and congenital malformations. In some contexts, female health workers are also subject to gender-based violence from coworkers and patients.^[39]^[40]

Workforce shortages

[edit]

See also: Health workforce, Doctor shortage, and Nursing shortage

Many jurisdictions report shortfalls in the number of trained health human resources to meet population health needs and/or service delivery targets, especially in medically underserved areas. For example, in the United States, the 2010 federal budget invested \$330 million to increase the number of physicians, physician assistants, nurse practitioners, nurses, and dentists practicing in areas of the country experiencing shortages of trained health professionals. The Budget expands loan repayment programs for physicians, nurses, and dentists who agree to practice in medically underserved areas. This funding will enhance the capacity of nursing schools to increase the number of nurses. It will also allow states to increase access to oral health care through dental workforce development grants. The Budget's new resources will sustain the expansion of the health care workforce funded in the Recovery Act.^[41] There were 15.7 million health care professionals in the US as of 2011.^[36]

In Canada, the 2011 federal budget announced a Canada Student Loan forgiveness program to encourage and support new family physicians, physician assistants, nurse practitioners and nurses

to practice in underserved rural or remote communities of the country, including communities that provide health services to First Nations and Inuit populations.^[42]

In Uganda, the Ministry of Health reports that as many as 50% of staffing positions for health workers in rural and underserved areas remain vacant. As of early 2011, the Ministry was conducting research and costing analyses to determine the most appropriate attraction and retention packages for medical officers, nursing officers, pharmacists, and laboratory technicians in the country's rural areas.^[43]

At the international level, the World Health Organization estimates a shortage of almost 4.3 million doctors, midwives, nurses, and support workers worldwide to meet target coverage levels of essential primary health care interventions.^[44] The shortage is reported most severe in 57 of the poorest countries, especially in sub-Saharan Africa.

Nurses are the most common type of medical field worker to face shortages around the world. There are numerous reasons that the nursing shortage occurs globally. Some include: inadequate pay, a large percentage of working nurses are over the age of 45 and are nearing retirement age, burnout, and lack of recognition.^[45]

Incentive programs have been put in place to aid in the deficit of pharmacists and pharmacy students. The reason for the shortage of pharmacy students is unknown but one can infer that it is due to the level of difficulty in the program.^[46]

Results of nursing staff shortages can cause unsafe staffing levels that lead to poor patient care. Five or more incidents that occur per day in a hospital setting as a result of nurses who do not receive adequate rest or meal breaks is a common issue.^[47]

Regulation and registration

[edit]

Main article: Health professional requisites

Practicing without a license that is valid and current is typically illegal. In most jurisdictions, the provision of health care services is regulated by the government. Individuals found to be providing medical, nursing or other professional services without the appropriate certification or license may face sanctions and criminal charges leading to a prison term. The number of professions subject to regulation, requisites for individuals to receive professional licensure, and nature of sanctions that can be imposed for failure to comply vary across jurisdictions.

In the United States, under Michigan state laws, an individual is guilty of a felony if identified as practicing in the health profession without a valid personal license or registration. Health professionals can also be imprisoned if found guilty of practicing beyond the limits allowed by their licenses and registration. The state laws define the scope of practice for medicine, nursing, and a number of allied health professions.^[48]^[*unreliable source?*] In Florida, practicing medicine without the appropriate license is a crime classified as a third degree felony,^[49] which may give imprisonment up to five years. Practicing a health care profession without a license which results in serious bodily injury classifies as a second degree felony,^[49] providing up to 15 years'

imprisonment.

In the United Kingdom, healthcare professionals are regulated by the state; the UK Health and Care Professions Council (HCPC) protects the 'title' of each profession it regulates. For example, it is illegal for someone to call himself an Occupational Therapist or Radiographer if they are not on the register held by the HCPC.

See also

[edit]

- List of healthcare occupations
- Community health center
- Chronic care management
- Electronic superbill
- Geriatric care management
- Health human resources
- Uniform Emergency Volunteer Health Practitioners Act

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Frequently Asked Questions

What happens if the system goes down? Will my child's treatment be affected?

Redundancies, backups, and established procedures minimize downtime and ensure treatment continuity; local backups also exist.

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